

## **Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

- 1 1. (Currently Amended) Method for measuring the binding of analyte molecules to  
2 probe molecules, the method comprising the following steps:
- 3 (a) providing a circuit surface having electronic circuits, a contact spot and a  
4 metal counterelectrode thereon,
- 5 (b) immobilizing probe molecules, in spatial proximity to the electronic circuits,
- 6 (c) binding nanoparticles to the analyte molecules with adhesion molecules,  
7 each nanoparticle having a metal surface formed of a metal suitable for  
8 binding to the adhesion molecules,
- 9 (d) placing the analyte molecules in the vicinity of the probe molecules in  
10 order to facilitate binding of the analyte molecules to the probe molecules,
- 11 (e) selecting the counterelectrode metal and the nanoparticle surface metal  
12 from an electrochemical series, introducing an electrolyte adjacent the  
13 circuit surface and establishing an electrical contact between the metal  
14 surfaces on the nanoparticles and the contact spot without destroying the  
15 nanoparticles so that the counterelectrode and the metal surfaces of the  
16 intact nanoparticles form electrodes of a galvanic cell, and
- 17 (f) measuring one of a ~~substantially constant~~ galvanic cell current and a  
18 ~~substantially constant~~ galvanic cell voltage generated between the  
19 electrodes of the galvanic cell in the electronic circuits, thereby enabling  
20 the binding of the analyte molecules to the probe molecules to be  
21 measured.

2.-3. (Canceled).

- 1 4. (Previously Presented) Method according to Claim 1, wherein the probe  
2 molecules are immobilized on the circuit surface in spatial proximity to the  
3 electronic circuits.
- 1 5. (Previously Presented) Method according to Claim 1, wherein the probe  
2 molecules are immobilized in spatial proximity to the electronic circuits on a  
3 countersurface, positioned opposite the circuit surface.
- 1 6. (Previously Presented) Method according to Claim 1, wherein the probe  
2 molecules are immobilized by covalent binding and, in step (d), the analyte  
3 molecules bind by affinity to the probe molecules.
- 1 7. (Previously Presented) Method according to Claim 1, wherein the nanoparticles  
2 are bound to the analyte molecules before step (d).
- 1 8. (Previously Presented) Method according to Claim 1, wherein the nanoparticles  
2 are bound to the analyte molecules after step (d).
- 9.-10. (Canceled).
- 1 11. (Currently Amended) Method according to Claim 1, wherein the electrical contact  
2 between the nanoparticles and the contact spot is established by electrically  
3 conductive molecules other than the nanoparticles.
- 1 12. (Original) Method according to Claim 11, wherein the electrically conductive  
2 molecules are compounds of the polyene class.
- 1 13. (Previously Presented) Method according to Claim 1, wherein the electrical  
2 contact between the nanoparticles and the contact spot is established by the  
3 nanoparticles touching the contact spot.

- 1 14. (Previously Presented) Method according to Claim 13, wherein analyte  
2 molecules with nanoparticles bound thereto are bound to probe molecules  
3 immobilized on an insulating surface opposite the circuit surface, and the  
4 electrical contact of the nanoparticles with the contact spot is established by  
5 moving the insulating surface and the bound nanoparticles towards the circuit  
6 surface so that the nanoparticles touch the contact spot.
- 1 15. (Previously Presented) Method according to Claim 13, wherein analyte  
2 molecules having magnetizable nanoparticles bound thereto are bound to probe  
3 molecules immobilized on a surface opposite the circuit surface; the linkages  
4 between the nanoparticles and the analyte molecules or the linkages between  
5 the analyte molecules and the probe molecules are broken; and the electrical  
6 contact of the now no longer immobilized nanoparticles with the contact spot of  
7 the circuit surface is established by an external magnetic field acting on the  
8 nanoparticles.
- 1 16. (Previously Presented) Method according to Claim 13, wherein analyte  
2 molecules having magnetizable nanoparticles bound thereto are bound to probe  
3 molecules immobilized on the contact spot of the circuit surface, and electrical  
4 contact of the nanoparticles with the contact spot is established by the effect of  
5 an external magnetic field or by mechanical pressure of a countersurface on the  
6 nanoparticles.
- 1 17. (Original) Method according to Claim 13, wherein the circuit surface or the  
2 surface of the nanoparticles is loaded with electrically conductive protrusions.
- 1 18. (Previously Presented) Method according to Claim 1, wherein DNA oligomers are  
2 used as probe molecules, the analyte molecules are amplified prior to step (d) by  
3 polymerase chain reactions (PCR) using a biotinylated primer, and the  
4 nanoparticles are coated with streptavidin, enabling binding of the nanoparticles  
5 to biotin groups of the analyte molecules by a biotin-streptavidin binding pair.

19. (Previously Presented) Method according to Claim 18, wherein the analyte molecules are amplified prior to step (d) by polymerase chain reactions (PCR) using a primer, and the nanoparticles are coated with a substance that binds to molecules in the primer, enabling binding of the nanoparticles to the analyte molecules so that instead of the biotin-streptavidin binding pair another binding pair is used.